



4th November 2016
In-tree Conference



Federal Ministry
of Food
and Agriculture

Silvicultural strategies for introduced tree species in Northern Italy



UNIVERSITÀ
DEGLI STUDI
DI PADOVA

TESAF

Tommaso Sitzia

Università degli Studi di Padova

tommaso.sitzia@unipd.it

**BIODIVERSITY
REVIEW**



Trees and shrubs as invasive alien species – a global review

David M. Richardson^{1*} and Marcel Rejmánek²

**BIODIVERSITY
LETTER**



Trees and shrubs as invasive alien species – 2013 update of the global database

Marcel Rejmánek^{1*} and David M. Richardson²

Total

751 species

434 trees and 317 shrubs

Europe

134 species

73 trees and 61 shrubs



Forest management in Europe

- Millenarian history of use
- Long history of planning: huge amount of information available
- Complex - not always harmonized - regulatory framework
- Regional diversity of silvicultural approaches

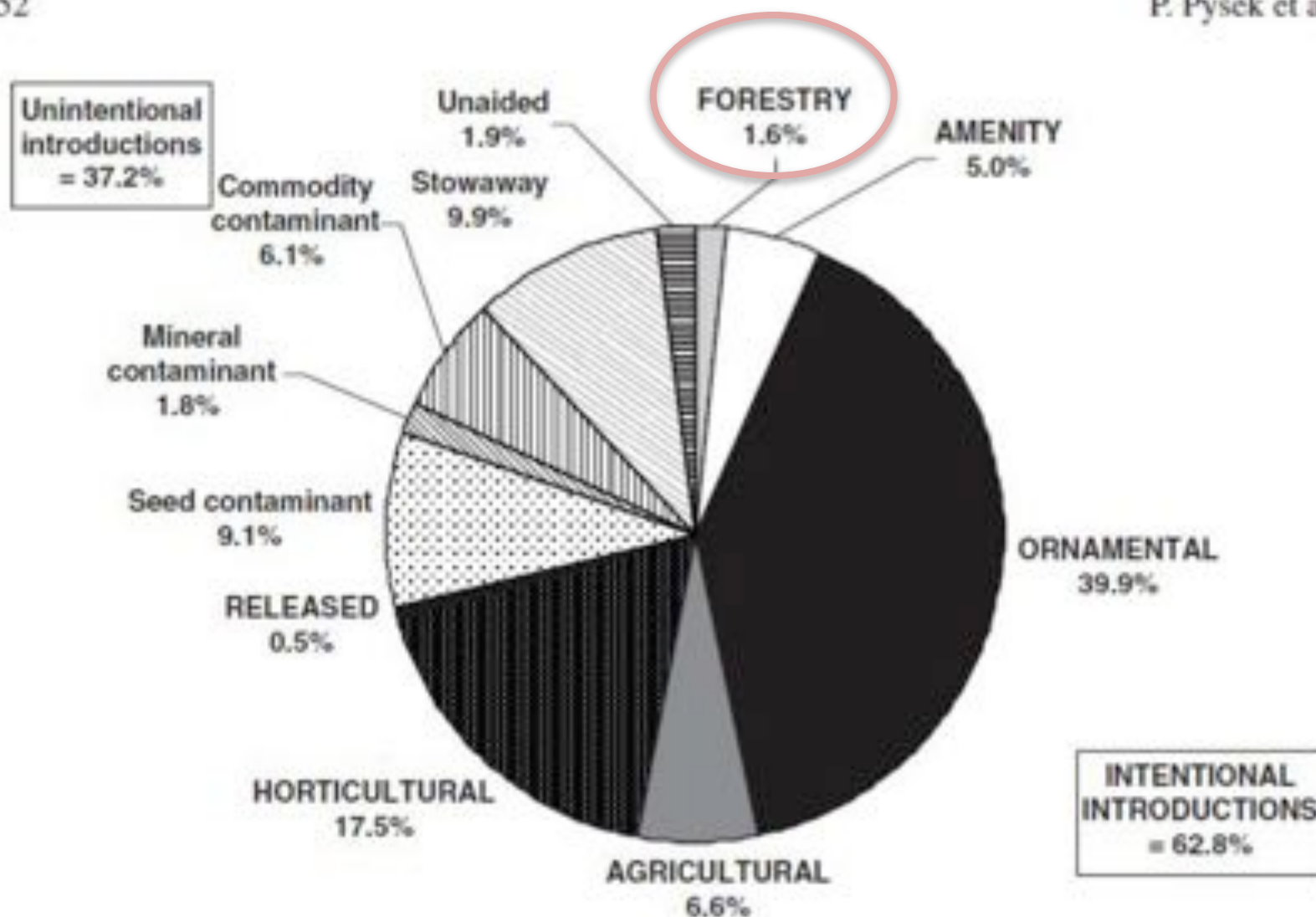


Fig. 4.4 Relative contribution of pathways of introduction shown for naturalised aliens to Europe, i.e. species with the area of origin outside Europe. Pathways of intentional introductions are in upper case letters, unintentional in lower case (Based on 1,983 naturalised aliens. Data from Lambdon et al. 2008)

Low annual utilization rate



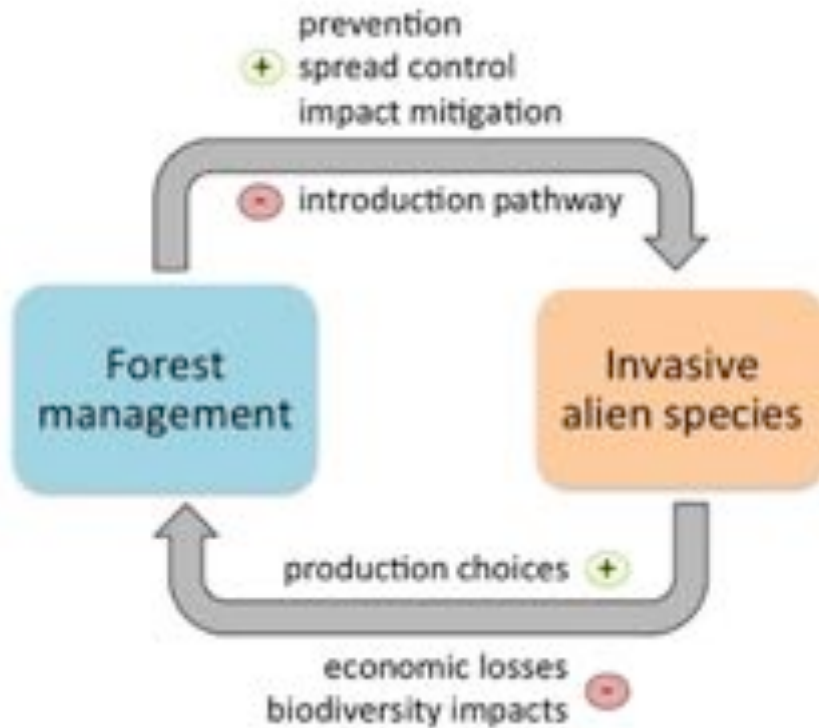
«Taking up and further developing such mobilisation practices can [...] help to achieve renewable energy targets as well as provide additional jobs and income in rural areas»

EC Agriculture and Rural Development, 2010, p.74

Silviculture: a partner

Using forest management to control invasive alien species: helping implement the new European regulation on invasive alien species

Tommaso Sitrá · Thomas Campagnaro ·
Ingo Kowarik · Giovanni Trentanovi



Forest management and Habitats Directive: conservation measures

(inspired by C. Sobotta, Court of Justice of the European Union,
Presentation made at a Padova Conference 21-23 June 2016)

Art. 1 (l)

the **necessary** conservation measures are applied for the maintenance or restoration, at a **favourable conservation status**, of the natural habitats and/or the populations of the species for which the site is designated

Art. 6 (a)

For special areas of conservation, Member States shall establish the **necessary** conservation measures involving, if need be, appropriate management plans [...] which correspond to the **ecological requirements** of the natural habitat types in Annex I and the species in Annex II present on the sites.

SCIENTIFIC UNCERTAINTY



Legal boundaries

(after C. Sobotta, Court of Justice of the European Union)

- COM/UK C-6/04, EU:C:2005:626, § 34: in implementing Art. 6(2), it may be necessary to adopt ... measures to prevent natural developments that may cause the conservation status of species and habitats in SACs to deteriorate
- In spite of scientific uncertainty **some management is necessary**, even inaction is management and will have consequences
- There is a **margin of appreciation** as regards ecological requirements, the necessity of measures and preferences between conflicting conservation objectives
- Procedural requirement should be respected
 - Best scientific knowledge
 - Stakeholder participation
 - Duty to give reasons

Case study species

- Tree of heaven (*Ailanthus altissima*)
- Black locust (*Robinia pseudoacacia*)
- Red oak (*Quercus rubra*)

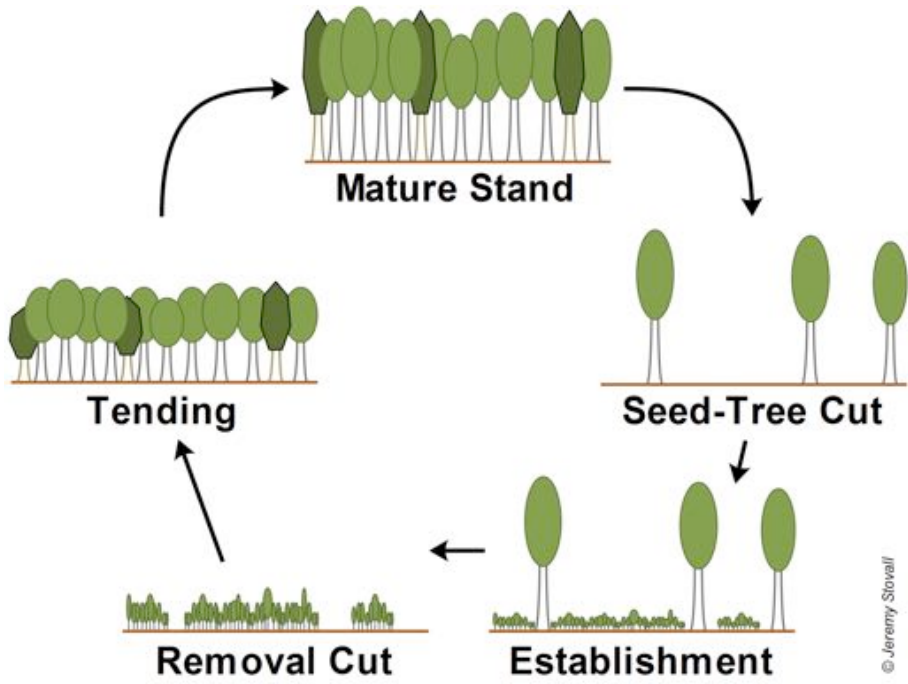


Tree to be
coppiced

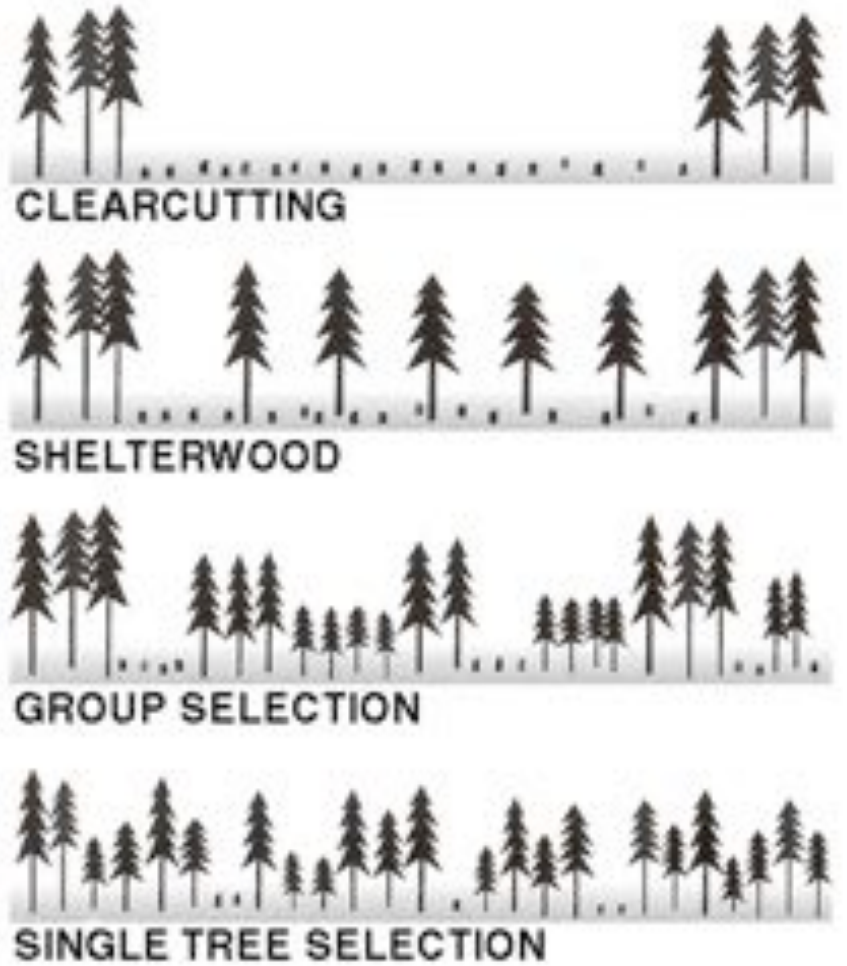
Cut close
to base
in winter

Shoots rapidly
regrow from
stool the
following spring

Coppice ready
for harvest
between 7-20
years



© Jeremy Stovall



Silviculture

Intermediate Cuttings

- Cleaning
- Thinning
- Improvement cutting
- Sanitation cutting
- Salvage cutting

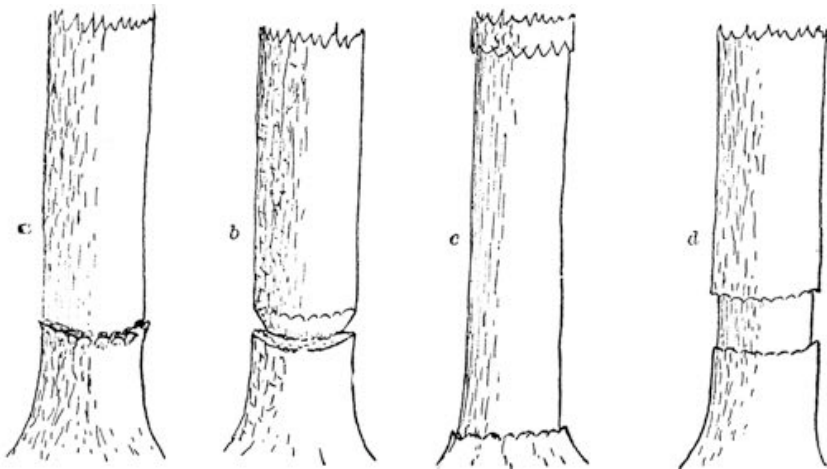
Even-aged
management

Uneven-aged
management

Harvest Cuttings

Clearcutting
Seed-tree system
Shelterwood
system
Coppicing
Single-tree
Group selection
system





Before



After



Ailanthus altissima

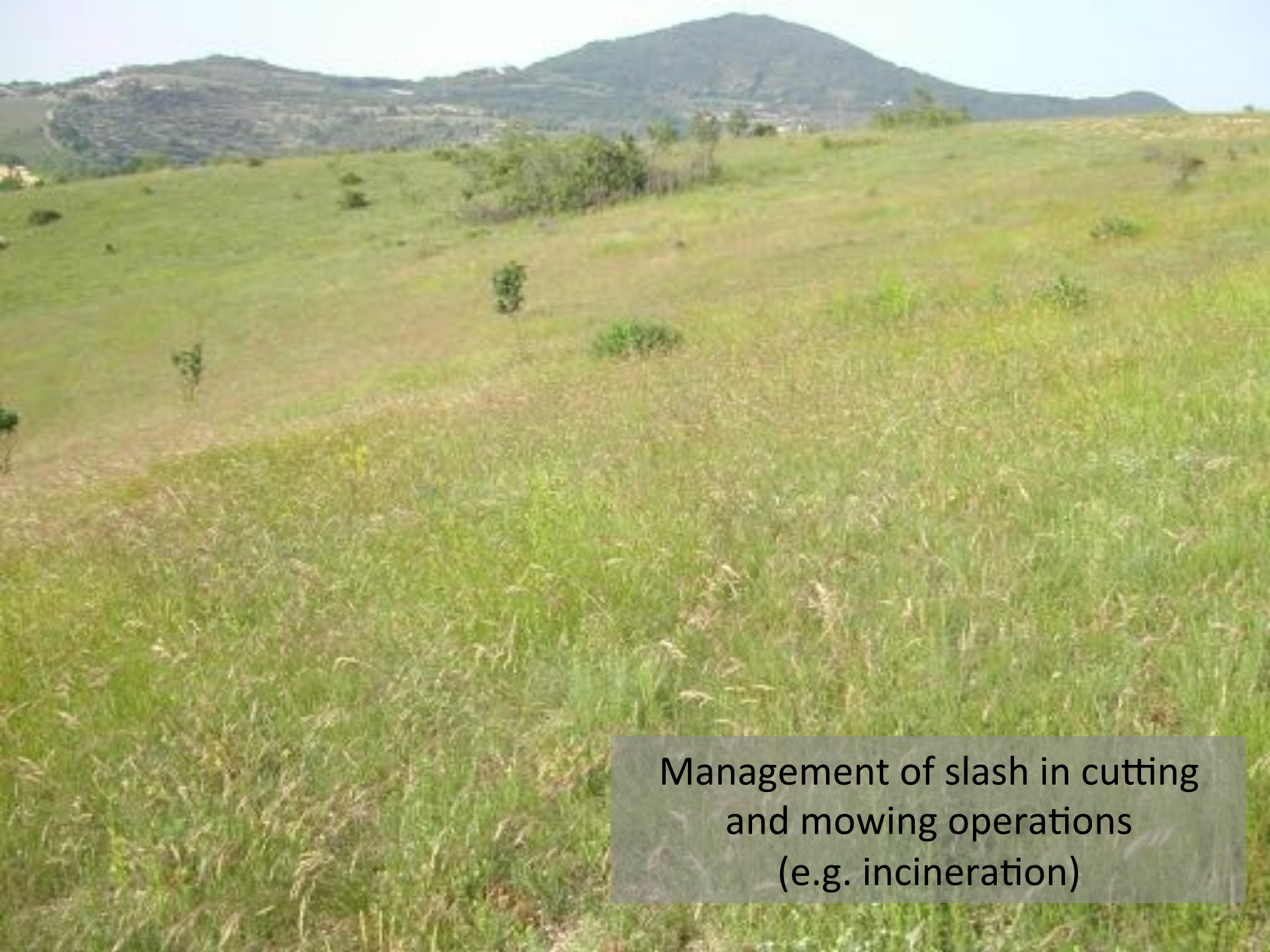
- Wide range of soil conditions
- Uncommon in very closed canopies
- Early-successional
- Allelopathic
- Low palatability of leaves





Silvicultural measures

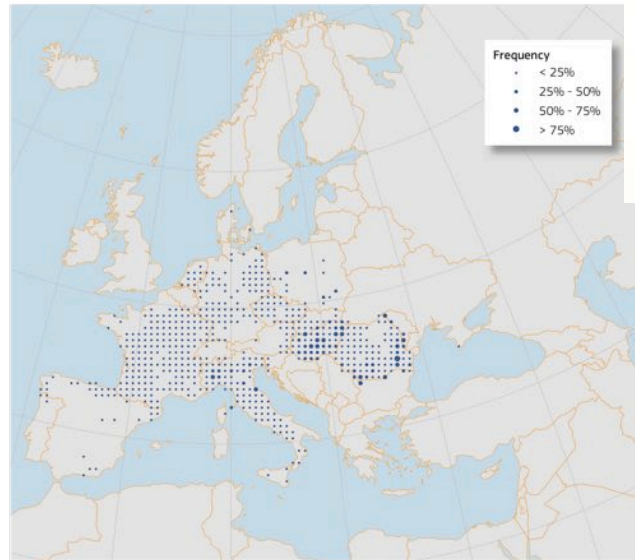
- Avoid coppicing (Radtke et al. 2013)
- Cut seed trees (Skowronek et al. 2014)
- Under-plant or seed shade-tolerant native species (Skowronek et al. 2014)
- Prescribed burning (Rebbeck et al. 2014)
- Protective belt of native trees (ECORICE 2015)



Management of slash in cutting
and mowing operations
(e.g. incineration)

Black locust

- Light-demanding pioneer species
- Disturbance favours clonal growth
- Wide range of soil conditions
- Limited by frost and drought



European
Union
grassland
habitats
threatened by
black locust in
North Italy



Silvicultural measures

- Avoid coppicing (Radtke et al. 2013) or coppicing in June
- Coppice ageing (Motta et al. 2009)
- Promote native species
- Conversion of coppice to high forest
- Release high number of standards in coppices (Radtke et al. 2013)
- Avoid clearcutting and openings (Terwei et al. 2013)
- Girdling (Maetzke 2005)
- Protective belt of native trees (Giambastiani et al. 2005)
- Single-tree selection or group selection (Terzuolo and Canavesio 2010)
- Pollarding (Maltoni et al. 2012)



Red oak

- Acidic and compacted soils
- Intermediate in shade-tolerance
- Mid-seral species
- Listed as invasive in Poland, Czech Republic, Belgium and Latvia



Silvicultural measures

- Under-plant or seed shade-tolerant native species (e.g. fast growing like birch)
- Repeated spring or summer coppicing
- Soil tillage

Habitats from alien species

Example:

producing *chablis*, logs and snags
Bosco Fontana (Mantova)





Code of conduct

G. Brundu & D. M. Richardson

Strasbourg, 8 October 2011
(Draft_2011.docx)

T-PVS/Inf (2011) 1

CONVENTION ON THE CONSERVATION OF EUROPEAN WILDLIFE
AND NATURAL HABITATS

Steering Committee

35th meeting
Strasbourg, 1st-4 December 2011

CODE OF CONDUCT ON PLANTATION FORESTRY AND INVASIVE ALIEN TREES

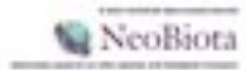
- SECOND DRAFT -

Document prepared by
Mr Giuseppe Brundu & Mr David M. Richardson
Department of Agriculture, University of Sassari, Italy - Centre for Invasive Biology, Department of
Botany & Zoology, Stellenbosch University, South Africa
(on behalf of the Bern Convention)

This document will not be distributed at the meeting. Please bring the copy
to the document for review after the meeting. Please do not make any changes.

November 2011 © (2011)
doi:10.1017/S1446780711000711
<http://neobiota.pensoft.net>

RESEARCH ARTICLE



Planted forests and invasive alien trees in Europe: A Code for managing existing and future plantings to mitigate the risk of negative impacts from invasions

Giuseppe Brundu¹, David M. Richardson²

¹ Department of Agriculture, University of Sassari, Viale Italia 39, 07100 Sassari, Italy ² Centre for Invasive
Biology, Department of Botany & Zoology, Stellenbosch University, South Africa

- Awareness
- Prevention and containment
- Early Detection and Rapid Response
- Outreach
- Forward planning



MAIDENTREE



COPPARD



COPPICE



SHERDEDTREE



MANAGED POLLARD



LAPSIDPOLLARD



LAYERING



BUNDLE PLANTING



STORED STEM



PHOENIX REGENERATION

Diversification of the urban forest—Can we afford to exclude exotic tree species?

Henrik Sjöman^{a,b,*}, Justin Morgenroth^c, Johanna Deak Sjöman^a, Arne Sæbø^d, Ingo Kowarik^e

Urban Ecosyst (2016) 19:475–487
DOI 10.1007/s11252-015-0475-3

Novel woodland patches in a small historical Mediterranean city: Padova, Northern Italy

Tommaso Sitzia¹ • Thomas Campagnaro¹ • Robert George Weir^{1,2}



Conclusions

- Measures suitability depends on
 - invasive species traits
 - invasion stage
 - site and environmental conditions
 - legal constraints (ability to give reasons)
 - stakeholders
- Recent studies suggest that alien tree species (e.g. red oak) might adapt faster than expected and develop different frequencies of traits in their alien ranges
- Stand and landscape scales (e.g. adjacent habitats) to be considered
- Silviculture and forest planning are partners
- Further research and application is needed

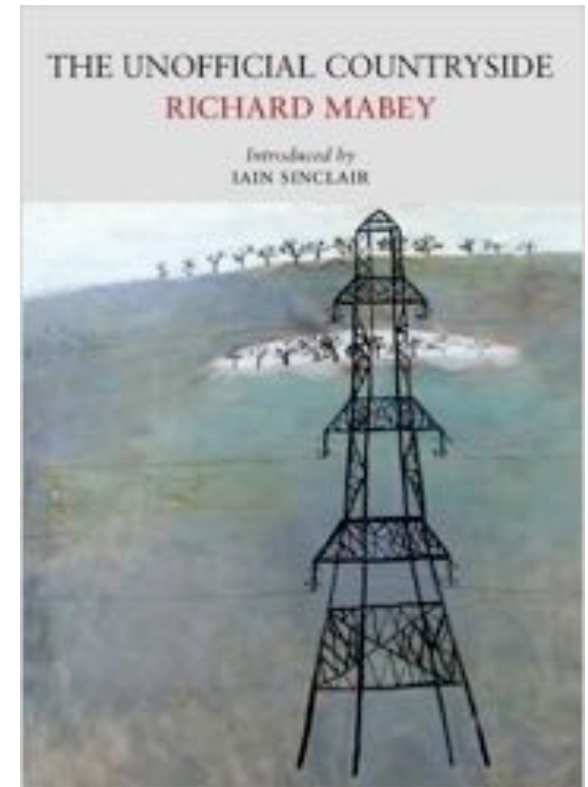
“The forester who practises
much writes but little, and who
writes much practises but little”
this is “why forestry is still so
backward”

Heinrich Cotta 1817



Urban silviculture and alien trees? Richard Mabey note to the 2010 edition of “The unofficial countryside”

«Since *The unofficial countryside* was first published in 1973 [...] Spontaneous greenspace has become demonised as **worthless brownfield**, and an anaemic tidiness creeps across all the last fragments of free land. Urban nature, of course, moves elsewhere, if it can. That **adaptability** is its signature and its saving grace. And it's this perennial opportunism and **exuberance** that is the real story»



Acknowledgements

- Fabio Meloni, Renzo Motta, Etienne Branquart and Giorgio Vacchiano